

NOTES ON SOME AFRICAN
CERATOPOGONINAE—SPECIES OF THE
GENUS *LASIOHELEA*

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PLATE XXII

In the collection of Ceratopogonine midges made by us in West Africa, mainly between the years 1919 and 1922, were a number of specimens (including one male) which appear to us to belong to the genus *Lasiohelea*. In examining these specimens we have had the advantage of comparing them with named examples of *L. stylifer* presented by Dr. Lutz to the Liverpool School of Tropical Medicine, and with the co-types of *L. lefanui* (Carter). The majority of our specimens are undoubtedly *L. lefanui*, but others appear to be new species and are here briefly described.

It is extremely difficult to define the genus *Lasiohelea*, or to state precisely in what respects it differs from the genera *Forcipomyia* and *Atrichopogon*. Kieffer who erected the genus in 1921 for his species *Atrichopogon pilosipennis*, gives only the following definition: hairiness of the wings as in *Forcipomyia*; empodium as long as the claws, with short hairs; palps having the last segment long; otherwise as in *Atrichopogon*. We have not had an opportunity of examining *L. pilosipennis*, but we have examined *L. stylifer* which is generally admitted to belong to the same genus, and as regards this species at any rate, Kieffer's definition is scarcely adequate, for in it the hairiness of the wings is less dense than in *Forcipomyia* and of a somewhat different character, the hairs on the empodium are not

short, the last segment of the palp is scarcely, if at all, longer than the penultimate segment, and in other respects (*e.g.*, the size of the microtrichia and the form of the radial cells of the wing) there are marked differences between it and *Atrichopogon*.

More recently (1922) Edwards has published an interesting note on the genus, in which he refers to its kinship with *Atrichopogon* and *Forcipomyia* more specifically than does Kieffer. *Lasiohelea* resembles *Atrichopogon*, he says, in the structure of the antennae and in wing venation, having a very long second radial cell (which however is narrower than in *Atrichopogon*) and an obliterated first radial cell; it resembles *Forcipomyia* in having the wings rather densely clothed with macrotrichia, but the hairs are less close-lying than in *Forcipomyia* and there are bare lines adjoining the veins, as in *Atrichopogon*. He states also that the microtrichia on the wings of *Lasiohelea* are 'smaller than those of *Atrichopogon*, but more obvious than those of *Forcipomyia*.'

We are doubtful if there is any real difference between the microtrichia of *Lasiohelea* and those of *Forcipomyia*; in both genera they are small and slightly variable in size in different species; but between the microtrichia of *Lasiohelea* and those of *Atrichopogon* the difference is much more marked and may serve as a ready means of separating these genera. It is more difficult to find a clear distinction between *Lasiohelea* and *Forcipomyia*. The hairiness of the wings is a variable character and the bare areas along the veins are not always present in *Lasiohelea*; the structure of the antennae is also variable within wide limits, so that for diagnostic purposes we are apparently forced to rely on the form of the radial cells of the wing, the first cell in *Lasiohelea* being obliterated and the second long and narrow, extending beyond the middle of the wing. These cannot be considered satisfactory characteristics, for the first radial cell is not always entirely obliterated in *Lasiohelea* and *Forcipomyia* (as can readily be demonstrated by appropriate staining) and the second radial cell varies considerably in length and width in *Forcipomyia* and sometimes extends beyond the middle of the wing. The genera in which the thorax is not prolonged over the head as a hood, the empodium well developed, as long as the claws and with long hairs, and the femora and fifth tarsal segments unarmed, may perhaps, however, be distinguished as follows:—

1. Costa reaching beyond the middle of the wing, usually two-thirds its length; second radial cell usually very long; fringe on the posterior border of the wing composed of simple hairs.....2
 Costa usually not reaching beyond the middle of the wing or only slightly; second radial cell not very long; fringe on the posterior border of the wing with hairs which are usually lanceolate and sometimes pubescent or sub-plumose.....3
2. First and third veins of the wing forming two distinct cells; microtrichia large and conspicuous; fringe on the posterior border of the wing composed of a single row of alternating long and short, simple, straight hairs..... *Atrichopogon*
 First radial cell obliterated or nearly, second very narrow; microtrichia minute; fringe on the posterior border of the wing composed of long hairs between two rows of shorter, oblique, hairs..... *Lasiohelea*
3. Wings densely clothed with hairs or scales.....4
 Wings with microtrichia only. (Fifth segment of palp sub-spherical, fourth long; costa not reaching beyond the middle of the wing; first tarsal segment of hind legs half the length of the second)..... *Microhelea*
4. Scales on wings and legs..... [*Lepidobelea*]
 Without scales..... *Forcipomyia*

So far as we can determine from the examination of our specimens collected in West Africa, and of the examples of *L. styliifer* and *L. lefanui* in the collection of the Liverpool School of Tropical Medicine, the following are the chief characters of the genus *Lasiohelea*.

LASIOHELEA, Keiffer, 1921

Head. Eyes bare or more or less hairy; broadly contiguous above, but with the facets sometimes rather widely separated. Palpi sometimes with the fifth segment longer than the fourth; third segment with or without a sensory pit. Mouth parts well chitinised. Labium fleshy, somewhat similar to that of *Culicoides*. In *L. lefanui* the labrum tapers distally, ends in a sharp point, and is not armed with teeth; the mandibles are strongly chitinised, taper in the distal third, end in sharp points, and bear a row of

about twenty-five small teeth along the distal margin; the maxillae are shorter than the mandibles and less highly chitinised, and bear fewer teeth, about fifteen, distally; and the hypopharynx is strongly chitinised, tapers distally, and ends sharply. *Antennae* of female with flagellum segments sometimes forming an almost continuous series, sometimes with the basal segments short and broad and the last five segments much elongated, an abrupt change of shape taking place between the tenth and eleventh segments. In none of the species examined by us were the basal segments so short and broad ('transversaux') as they often are in *Atrichopogon*. Terminal segments of antenna not definitely sculptured, but in some species irregularly chitinised and having in consequence a patterned appearance. Whorls of hairs on the basal segments composed of about eight to twelve hairs; large spines usually only a little stouter than the hairs, about as long as the segments, straight or nearly, and tapering to more or less pointed extremities. *Thorax*. Scutellum bearing few bristles and hairs, the former in a transverse row, often with the most lateral bristle on each side somewhat apart from the rest. *Wings* usually short and broad, with a rounded distal extremity. Fringe on the posterior part of the wing composed of long hairs between two rows of shorter oblique hairs, not as in *Atrichopogon* of practically a single row of alternating long and short straight hairs. Fringe hairs apparently simple and straight. Border of wing thickened, especially anteriorly; the gap just beyond the end of the costa distinct. Microtrichia small, as in *Forcipomyia*, smaller than in *Atrichopogon*. Macrotrichia covering the wings more or less completely and densely, but not so densely as in *Forcipomyia*, slightly curved, slender, hair-like, tapering to very sharply pointed ends. Those on the costa and the anterior veins sometimes broader, scale-like. There may or may not be definite bare areas along the veins, as in *Atrichopogon*. Costa reaching well beyond the middle of the wing, usually two-thirds the length. Sub-costa strongly developed, bearing stout hairs or scale-like hairs. First radial cell usually obliterated and at most very narrow and slit-like. Second radial cell very long and usually very narrow. Cross-vein oblique. Petiole of the fourth vein short, almost obsolete, rami obsolete proximally and sometimes very indistinct for their entire lengths. Bifurcation of the fifth vein

proximal to the level of the end of the costa, the rami terminating at the wing margin, the one proximal and the other distal to this level. *Legs.* First tarsal segment longer than the second on all the legs; on the hind legs usually two and a half to three times as long, but in one species examined by us, shorter, a little less than twice the length of the second. Terminal tarsal segments sub-cylindrical. In some species the tarsal segments bear fringed, striated scales in addition to hairs. Claws short, equal, usually rather stout and having a thickening about the middle. Empodium nearly as long as the claws, hairy, the hairs actually long, but curved and thus in some views appearing short. *Abdomen.* Well clothed with hairs and often with a small admedian tuft on each side of the eighth sternite. There may be either a single spermatheca or two spermathecae. The hypopygium of the single male examined by us resembled in some respects that of *Forcipomyia ingrami*.

KEY TO THE WEST AFRICAN SPECIES OF THE GENUS *LASIOHELEA*.

1. With scales on the legs.....2
Without scales.....5
2. Hind legs with first tarsal segment less than twice
the length of the second..... *L. brevitarsata*, sp.n.
Hind legs with first tarsal segment two to three
times the length of the second.....3
3. Third segment of palp without a sensory pit..... *L. nigeriae*, sp.n.
Third segment of palp with a sensory pit.....4
4. Spermatheca single, sub-spherical, the basal portion
not chitinised..... *L. lefanui* (Carter) var.
squamipes,* var. n.
Spermathecae two, pyriform..... *L. caliginosa*, sp.n.
5. Eyes hairy..... *L. litoreaurea*, sp.n.
Eyes bare.....6
6. Antenna with the segments of the flagellum forming
an almost continuous series, with no abrupt change
of shape between the tenth and eleventh
segments *L. inconspicua*, sp.n.
Antenna with the last five segments much elongated,
with an abrupt change of shape between the
tenth and eleventh segments..... *L. lefanui* (Cart.)

* This East African species is included here because it is very closely allied to *L. lefanui* and may eventually be found to occur also in West Africa.

LASIOHELEA NIGERIAE, sp.n.

Length of body* (two females and one male), 1.3 mm. to 1.4 mm.; length of wing, 0.9 mm. to 1.1 mm.; greatest breadth of wing, 0.3 mm. to 0.35 mm. The male is slightly longer than the females, and its wings slightly longer and narrower.

A dark brown insect with yellowish legs, closely resembling *L. lefanui* (Carter), but differing from the three co-types of this species in the following respects. *Head*. Eyes bare above, slightly hairy

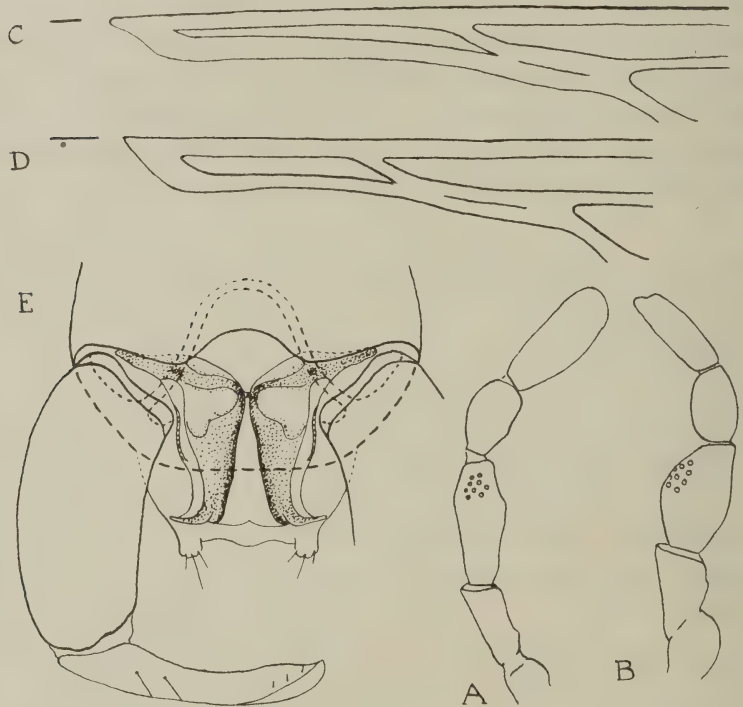


FIG. 1. *Lasiobelea nigeriae*, sp.n.: A. palp, ♂; B. palp, ♀; C. radial cells, ♀; D. radial cells, ♂; E. hypopygium, ♂, ventral view. [C. and D. \times c. 265, others \times c. 400.]

below and at the inner margins; broadly contiguous above in both sexes. Palpi (fig. 1, A and B) in both sexes with the fifth segment longer than the fourth; in the female the third segment a little inflated in the middle, in the male hardly at all, in both sexes without a sensory

* In all cases this measurement is taken from the anterior margin of the thorax to the tip of the abdomen of specimens mounted in pure carbolic acid.

pit but bearing sensory hairs on the inner anterior aspect. *Antennae*. In the female segments 4 to 10 similar to those of *L. lefanui*, the length and breadth of segments 4 and 10 in one specimen measuring 6 by 8, and 9 by 6 units* respectively; segments 11 to 15 elongated, rather longer than in *F. lefanui*, the lengths of the eleventh and fifteenth segments in one specimen measuring 20 and 25 units respectively. The combined length of segments 11 to 15 greater than that of segments 3 to 10 and twice as great as that of segments 4 to 10, the three actual measurements in one specimen being 109, 61, and 51 units respectively. In the single male in our possession the antennae are damaged, the terminal segments missing. Torus very large and very dark brown; flagellum segments brown. Segments 4 to 11 all about the same length, 12 units, but rapidly diminishing in greatest breadth from a little over 10 units in the case of the fourth segment to a little over 5 units in that of the eleventh. *Thorax*. Scutellum with fewer small hairs, about six in the female and one or two in the male. *Wings* (Pl. XXII, fig. 1) similar to those of *L. lefanui* but with the hairs on the costa and the anterior veins dark brown, lanceolate, scale-like. Bare areas along the veins well marked. Wings not so densely clothed with macrotrichia as in *L. lefanui*. At the base of the wing, between the fourth and fifth veins, one or two rows of macrotrichia; at the level of the bifurcation of the fifth vein, two rows between the fourth and fifth veins, three rows between the rami of the fourth vein, and two rows between the third and fourth veins. Microtrichia very minute. The tip of the wing rounded but not as broad as the broadest part of the wing. In the male the wings are slightly longer and narrower than in the female, costa reaching nearly to two-thirds of the length of the wing from the base (35:58), first radial cell obsolete, second long and narrow but neither so long nor so narrow as in the female (fig. 1, C and D), bifurcation of the fifth vein a little proximal to the end of the costa. *Legs*. Tarsal segments somewhat infuscated, bearing numerous striated scales which are most conspicuous on the distal segments. First tarsal segment of all the legs, over twice the length of the second, the actual measurements of the first two tarsal segments of the fore, middle, and hind legs of one female being 50 and 21, 47 and 22, and 59 and 26 units respectively.

* The unit referred to is 37 μ .

Abdomen bearing lanceolate, scale-like hairs similar to those on the wing, in addition to ordinary hairs. Abdomen of the male rather dark brown, narrow, with a conspicuous, dark brown hypopygium. Spermatheca single, sub-spherical, of the same form as that of *L. lefanui*, diameter about 60μ , the base not chitinised; the diameter at the level where the chitinisation ceases about 25μ .

HYPOPYGIUM (fig. 1, E). *Ninth segment* dark brown: tergite hairy, with a posterior extension similar to that of *Forcipomyia*; sternite with fairly numerous hairs restricted to the anterior part, slightly notched in the middle line posteriorly. *Forceps* well developed: side-pieces about twice as long as broad, moderately hairy, their proximal ends with a highly chitinised rim; claspers brown, well chitinised, their ends somewhat spoon-shaped. *Harpes*: there are no posteriorly projecting plates. The strongly chitinised dorsal root-like processes arising at the bases of the side-pieces are long and join anteriorly across the middle line forming a wide arch somewhat similar to that of *Forcipomyia ingrami*. *Aedoeagus* a highly complicated structure, partly chitinised, partly membranous; in ventral view the chitinised portions appear as two roughly triangular objects with their apices apposed in the middle line a little posterior to the margin of the ninth sternite. In lateral view there is seen to be on each side at the distal end a process directed dorsally.

NIGERIA: Calabar, February, 1922, 1 ♂, 2 ♀♀ (Dr. E. C. Braithwaite).

Four specimens (♀♀) of *L. styliifer*, named by Dr. Lutz, in the collection of the Liverpool School of Tropical Medicine show scales similar to those of the species described above; but on the three co-types (♀♀) of *L. lefanui* in the same collection, and on some specimens collected by us in Nigeria and the Gold Coast, and on others sent to us by Dr. J. R. C. Stephens from Ilorin, Nigeria, which appear to us to be *L. lefanui*, we are unable to find any such scales. The species described above, therefore, resembles *L. styliifer* even more closely than *L. lefanui*, but there are certain differences, e.g., in the palps which in *L. styliifer* have a large sensory pit in the third segment and the fourth and fifth segments subequal, and in the absence of a comparison of the genitalia of the male, we think the two species must be regarded as distinct although undoubtedly closely allied.

LASIOHELEA BREVITARSATA, sp.n.

Length of body (one female), 0.9 mm. ; length of wing, 0.8 mm. ; greatest breadth of wing, 0.3 mm. Resembling the preceding species, *L. nigeriae*, in almost every respect, but smaller and with relatively shorter first tarsal segments.

Head. Eyes very slightly hairy, as in *L. nigeriae*. Palpi as in *L. nigeriae*. *Antennae* similar to those of *L. nigeriae* but smaller. Segments 4 and 10 measuring approximately 6 by 6, and 7.5 by 5 units respectively. Segments 11 to 14 sub-equal, about 15 by 5 units; the fifteenth segment a little longer, about 20 by 5 units, and ending in a blunt stylet. The combined length of segments 11 to 15 (78 units) greater than that of segments 3 to 10 (50 units), and not quite twice that of segments 4 to 10 (43 units). *Thorax.* Scutellum bearing a transverse row of eight bristles and a few (six) smaller hairs as in *L. nigeriae*. *Wings* (Pl. XXII, fig. 2). Shape of wing and distribution of macrotrichia as in *L. nigeriae*. Costa reaching nearly two-thirds of the wing length (25 : 43). Halteres somewhat infuscated. *Legs* bearing scales as in *L. nigeriae*. First tarsal segment of the fore and middle legs about twice, and of the hind legs a little less than twice the length of the second; the actual measurements of the first and second tarsal segments of the fore, middle, and hind legs being 37 and 18, 35 and 17, and 43 and 24 units respectively. *Abdomen* as in *L. nigeriae*. Spermatheca single, sub-spherical, of the same form as in *L. lefanui*, diameter about 50μ , the extreme base not chitinised, the diameter at the level where the chitinisation ends, about 15μ .

GOLD COAST: Accra, 1920, 2 ♀♀, taken in the laboratory.

LASIOHELEA LEFANUI, (Carter) var. *SQUAMIPES*, var. n.

In a former paper (1923) we stated that we had been unable to detect any differences by which *L. styliifer* could be distinguished from the African species which we described as *L. lefanui*. In connection with the present work we have had occasion to re-examine the co-types of *L. lefanui* and specimens of *L. styliifer* named by Dr. Lutz. Whilst agreeing in most respects these specimens differ slightly in a number of minor points which may be of less than specific importance, and more notably in that whereas *L. styliifer*

has numerous scales on the legs, the co-types of *L. lefanui* appear to be entirely without scales.

In a small collection of African Ceratopogoninae kindly lent to us for examination by Dr. G. A. K. Marshall of the Imperial Bureau of Entomology, were a number of specimens of *Lasiohelea*. In one tube, to which unfortunately no label indicating locality was attached, but which probably came from Zanzibar (Dr. W. Mansfield Aders), were several specimens of a species to which brief reference must be made. These insects resemble *L. lefanui* in almost every respect, but on the legs there are a few narrow scales (not so many, however, as in the specimens of *L. stylifer* we have examined). On the wings the bare areas along the veins are distinct. At the base of the wing, between the fourth and fifth veins, are two or three rows of macrotrichia; and at the level of the bifurcation of the fifth vein, about four rows between the fourth and fifth veins, three or four between the rami of the fourth vein, and two or three between the third and fourth veins. The distribution of macrotrichia is thus much as in *L. lefanui*, but more sparse than in *L. stylifer*, in which, in the examples examined by us, there are six or seven rows at the base between the fourth and fifth veins, and at the level of the bifurcation of the fifth vein about five rows between the fourth and fifth veins, four or five between the rami of the fourth vein, and three or four between the third and fourth veins. They differ from the species we have described above as *L. nigeriae* in having the wings more hairy, and the palps with the third segment furnished with a large but shallow sensory pit, and the last two segments sub-equal.

In the present state of knowledge of the genus, and in view of the apparent great variability of *L. lefanui*, we think it best to regard these specimens as a variety of that species and propose for them the name *Lasiohelea lefanui* (Carter) var. *squamipes*.

LASIOHELEA CALIGINOSA, sp.n.

Length of body (one female), 1.2 mm. ; length of wing, 1.0 mm. ; greatest breadth of wing, 0.4 mm. A very dark brown midge with dark brown legs on the tarsal segments of which are striated scales; closely resembling *L. nigeriae*.

Head very dark brown. Eyes bare ; broadly contiguous above, the facets narrowly separated. Clypeus, proboscis, and palpi dark brown. Mandibles apparently not armed with teeth. Palpi (fig.2, A) with fifth segment only slightly longer than the fourth, third slightly inflated in the middle and furnished with a small sensory pit. *Antennae*. Torus very dark brown, sub-spherical, not hollowed out anteriorly, bearing several longish hairs. Flagellum segments dark brown, but not so dark as the torus. Basal segments of the flagellum bearing large spines which are a little stouter than the hairs, slightly curved, about as long as the segments, tapering to not very sharp points ; and whorls of about ten to twelve hairs. Third segment larger than the fourth, with a quite short stalk. Segments 4 to 10 short and broad, from a little broader than long to a little

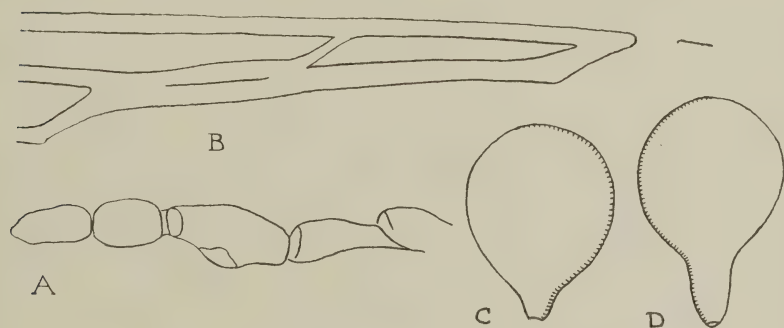


FIG. 2. *Lasiobelea caliginosa*, sp.n., ♀: A. palp; B. radial cells; C. and D. spermathecae. [B. \times c. 265, others \times c. 400.]

longer than broad, the fourth and the tenth segments actually measuring in length and breadth 7 by 8, and 8 by 7 units respectively. Segments 11 to 15 elongated, three to nearly four times as long as broad, their lengths in one female 17, 20, 21, 22, and 27 units respectively, the terminal segment ending in a blunt sessile stylet. The combined length of segments 11 to 15 greater than that of segments 3 to 10 and about twice as great as that of segments 4 to 10, namely 107, 59, and 50 units respectively. *Thorax*. Dorsum uniformly very dark brown ; pleura dark brown. Scutellum dark brown, but not so dark as the dorsum ; bearing a transverse row of about eight bristles, and about fifteen smaller hairs. Post-scutellum

very dark brown. *Wings* (Pl. XXII, fig. 3) unadorned, but the anterior border appears darker than the rest of the wing on account of the density of the hairs in this region. Microtrichia minute. Macrotrichia covering almost the entire wing, moderately densely. Bare areas along the veins indistinct. At the base of the wing between the fourth and fifth veins three or four rows of macrotrichia; at the level of the bifurcation of the fifth vein, about five rows between the fourth and fifth veins, about five rows between the rami of the fourth vein, and three or four rows between the third and fourth veins. The tip of the wing rounded but not the broadest part of the wing. Macrotrichia on the costa and anterior veins as in *L. nigeriae*, but narrower. Costa reaching beyond the middle of the wing (35 : 55). First radial cell obliterated, second long and narrow but not so long as in *L. nigeriae* (fig. 2, B). Bifurcation of the fifth vein well proximal to the end of the costa. Halteres with brown knobs. *Legs* rather dark brown, the tarsal segments paler brown than the proximal segments; well clothed with shortish hairs, and bearing striated scales on the tarsi. First tarsal segment over two-and-a-half times as long as the second on all the legs, *i.e.*, measuring in one specimen 53 : 19, 51 : 18, and 63 : 22 on the fore, middle, and hind legs respectively. Claws stout, equal, about half the length of the fifth tarsal segment. Empodium long and hairy. *Abdomen* very dark brown, the venter somewhat paler brown proximally; densely clothed with very dark hairs. Spermathecae two, very dark and highly chitinised, pyriform but somewhat dissimilar in both the females examined (see fig. 2), the total length and greatest breadth of the one, 63 μ by 50 μ , and of the other, 77 μ by 52 μ in one specimen.

GOLD COAST : Accra, 1920 and 1921, 2 ♀♀, taken in the laboratory.

This insect resembles closely both *L. stylifer* and the preceding species, *L. nigeriae*, but differs from both in a number of characters. For example, the third segment of the palp is furnished with a sensory pit, but it is only a small one; the first tarsal segments of the hind legs are relatively longer, nearly three times as long as the second; and the spermathecae are two and pyriform.

LASIOHELEA LITORAUREA, sp.n.

Length of body (two females), 0·8 mm.; length of wing, 0·7 mm.; greatest breadth of wing, 0·27 mm. A small brown midge, not very dark coloured, with paler brown legs: without scales.

Head darkish brown. Eyes hairy; narrowing above, the margins contiguous, but the facets separated rather widely, by about 18μ . Clypeus, proboscis, and palpi brown. Palpi with first segment small, second and fourth sub-equal, not quite twice as long as broad, fifth small, shorter than the fourth with which it is united rather broadly, third about as long as the fourth and fifth together, slightly inflated in the basal half, without a sensory pit, but with a shallow depression bearing sensory hairs on its inner aspect. *Antennae* (fig. 3, A) brown; torus darker than the flagellum segments. Third

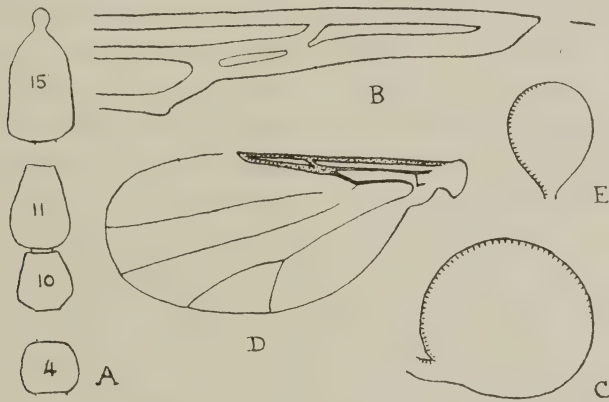


FIG. 3. *Lasiobelea litoraurea*, sp.n., ♀: A. segments 4, 10, 11, and 15, of antenna; B. radial cells; C. Spermatheca. *Lasiobelea inconspicua*, sp.n. ♀; D. diagram of wing venation; E. spermatheca. [D. \times c. 80, B. \times c. 265, others \times c. 400.]

segment with a short stalk. Segments 4 to 10 sub-equal, sub-spherical, the fourth being slightly broader than long, the tenth slightly longer than broad; bearing stout spines which are about as long as the segments and are not very sharply pointed at their ends, and whorls of about twelve hairs. Segments 11 to 15 more elongated, the change of shape between the tenth and eleventh being definite; segments 11 to 14 sub-equal, length about once-and-a-half the breadth, the fifteenth slightly longer and broader and ending in a small knob. The terminal segments (11 to 15) not definitely

sculptured, but chitinised irregularly and so presenting a somewhat patterned appearance. The combined length of segments 11 to 15 about equal to that of segments 3 to 10, *e.g.*, in one specimen, 41 to 43 units. *Thorax* brown, the dorsum much darker than the pleura; sparsely clothed with hairs. Scutellum dark brown; bearing two lateral and five centro-marginal bristles, and about six small hairs. Post-scutellum dark brown. *Wings* (Pl. XXII, fig. 4) unadorned; well-clothed all over with minute microtrichia and longish hairs. Macrotrichia of the usual type, extending over practically the whole wing with the exception of the radial areas. There are, however, indistinct traces (especially along the fifth vein) of bare areas along the veins. At the base of the wing, between the fourth and fifth veins, are three or four rows of macrotrichia; at the level of the bifurcation of the fifth vein, about five rows between the fourth and fifth veins, about five rows between the rami of the fourth vein, and three rows between the third and fourth veins. It is difficult to determine exactly the number of rows because they are irregular, and because the rami of the fourth vein are very indistinct, indeed almost obsolete. The macrotrichia on the costa and anterior veins are longer and stronger than those elsewhere on the wing, but are not scale-like. The tip of the wing is rounded and very broad. Fringe well developed, composed of three rows of straight, simple hairs; the border of the wing thickened excepting for a short distance just beyond the end of the costa. Costa reaching beyond the middle of the wing, almost two-thirds of its length (22 : 36). First radial cell indistinct but not entirely obliterated, second long and narrow (fig. 3, B). Bifurcation of the fifth vein a little proximal to the end of the costa. Halteres pale brown. *Legs* brown, not so dark as the rest of the body, almost uniformly coloured; well clothed with hairs, but without scales. Femora not swollen, unarmed. Fore tibiae with a small patch of large, spine-like hairs near the apex; hind tibiae with the usual two transverse rows of bristles distally. First tarsal segment more than twice the length of the second on all the legs, on the hind legs nearly three times as long (37 : 13); distal segments short, sub-cylindrical. Claws rather slender, about half the length of the last tarsal segment. Empodium long and hairy. *Abdomen* brown, sides paler; clothed with shortish brown hairs. Spermatheca (fig. 3, C) single, sub-spherical, diameter about 50μ ; duct arising obliquely and chitinised for a short distance.

GOLD COAST: Accra, 27.III.1920, 2 ♀♀, taken in the laboratory; Christiansborg, near Accra, 14.II.1916, 1 ♀ (Dr. J. W. S. Macfie), 'taken in the Castle.'

LASIOHELEA INCONSPICUOSA, sp.n.

Length of body (one female), 0.9 mm.; length of wing, 0.6 mm.; greatest breadth of wing, 0.27 mm. A small brown midge very similar to the preceding species (*L. litoraurea*), but differing from it in the following respects:—

Head. Eyes bare; facets separated only narrowly. *Antennae.* The flagellum segments form an almost continuous series, the change of shape between the tenth and eleventh segments being slight; the basal segments slightly broader than long, the distal ones slightly longer than broad, the measurements of length and greatest breadth of the fourth, tenth, eleventh, and fourteenth segments being 5 by 7, 6 by 6, 7 by 6, and 7 by 6 units respectively. The last segment is slightly longer and broader than the others, about 12 by 7 units, and ends in a blunt knob. The combined length of segments 11 to 15 slightly greater than that of segments 4 to 10, but slightly less than that of segments 3 to 10, namely, 41 units as compared with 37 and 44 units. *Thorax.* Scutellum bearing two lateral and seven centro-marginal bristles, and about twelve small hairs. *Wings* (fig. 3, D). Shape of wing and distribution of macrotrichia as in *L. litoraurea*, but the microtrichia rather larger, and the first radial cell obliterated. *Legs* as in *L. litoraurea*. *Abdomen.* Spermatheca (Pl. XXII, fig. 5 and text-fig. 3, E) single, pyriform, length about 38μ , greatest breadth about 30μ ; the duct chitinised for a very short distance, about 3μ .

GOLD COAST: Accra, 1920, 1 ♀, taken on a window in the laboratory in the evening.

LASIOHELEA LEFANUI, (Carter)

NIGERIA: Minna, 14.VIII.1910, 2 ♀♀ (Dr. J. W. S. Macfie); Ilorin, old Residency, 29.VIII.1920, numerous ♀♀ (Dr. J. R. C. Stephens), 'biting at 1 p.m.'; Mokwa, 16.XI.1921, several ♀♀ (Dr. J. R. C. Stephens), 'biting at noon.'

GOLD COAST: Accra, 1920, 1 ♀; Northern Territories, Bole, 26.VII.1918, Dogankade, 14.V.1918, Kulmasa, 22.VII.1918, Malowe, 29.VII.1918, Tanina, 21.VII.1918, and Ulu, 7.VII.1918, numerous ♀♀ (Dr. A. Ingram) 'taken in the act of biting.'

EXPLANATION OF PLATE XXII

- Fig. 1. Wing of female of *Lasiohelea nigeriae*, sp.n.
Fig. 2. „ „ *L. brevitarsata*, sp.n.
Fig. 3. „ „ *L. caliginosa*, sp.n.
Fig. 4. „ „ *L. litoraurea*, sp.n.
Fig. 5. „ „ *L. inconspicua*, sp.n.

Figs. 1 to 3 from unstained, figs. 4 and 5 from lightly stained preparations.